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DEFENSE PURCHASES AN INTRODUCTION TO DEIMS (DEFENSE  
ECONOMIC IMPACT MODELING SYSTEM)(U) ASSISTANT SECRETARY  
OF DEFENSE (PRODUCTION AND LOGISTICS) FAL 1987

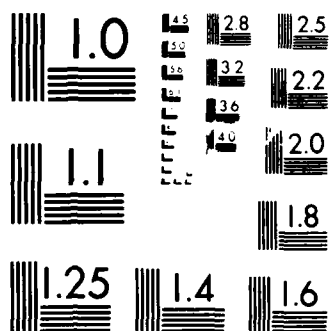
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# DEFENSE PURCHASES

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## AN INTRODUCTION TO DEIMS

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**Example:** The subject "Solid Rocket Motors" is Field 21, Group 08, Subgroup 2 (page 32, AD-624 000).

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## **DEFENSE PURCHASES**

### **An Introduction to DEIMS**



## DEPARTMENT OF DEFENSE CONTACTS

### Principal Point of Contact:

Office of the Assistant Secretary of Defense  
for Acquisition and Logistics  
Office of Industrial Base Assessment  
Two Skyline Place, Suite 1406  
5203 Leesburg Pike  
Falls Church, Virginia 22041  
(202) 756-2310 (AV 289-2310)

### Technical Questions About DEIMS:

Economic Analysis Division  
Office of the Director, Program  
Analysis and Evaluation  
Office of the Secretary of Defense  
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## 1. INTRODUCTION

The Department of Defense (DoD) has developed procedures for projecting defense purchases of the products of a large number of industries. These projections, which are updated annually, are made available on request to firms, trade associations, state and local government planning agencies, and other organizations with a serious interest in defense markets. Projections of DoD demand for skilled labor and strategic materials are also available.

THIS BOOKLET IS DIRECTED TO THOSE WHO INTEND TO USE THE PROJECTIONS. IT WILL HELP YOU INTERPRET THEM AND UNDERSTAND HOW THEY ARE PRODUCED.

The projections are made using a relatively new tool: the Defense Economic Impact Modeling System (DEIMS). DEIMS follows previous work in using an economic model to estimate demands for subassemblies, parts, and materials that the Defense Department generates by its purchases. DEIMS differs from past efforts, however, in using more detailed data on the DoD budget and specialized information on defense production.

The remainder of the booklet walks through sample DEIMS projections, describes how the projections are made, and discusses the sources of uncertainty in them. Attached at the end of the booklet is a form for ordering projections for particular industries. Along with the order form is a card designed to get your views on the projections and this booklet. Your comments will help us improve both the usefulness of the projections themselves and the way they are presented.

## 2. SAMPLE DEIMS PROJECTIONS

DEIMS projections are made for defense purchases from 429 industries. (The box below explains how these industries are categorized.) For each industry, the projections are presented in three tables:

- Table 1 shows projected DoD purchases and purchases by industrial sectors that supply finished goods to DoD;
- Table 2 reports projected purchases generated by outlays from various parts of the DoD budget; and
- Table 3 compares projected defense purchases with estimated total domestic production.

In order to illustrate what these tables contain, and how they are structured, this section presents sample projections for one industry--Semiconductors. Any other industry could serve just as well, however, as the format of the projections is the same in all cases.

*Table 1--Projected Defense Purchases.* The projections in Table 1 distinguish between "direct" and "indirect" defense purchases. "Direct defense purchases" are purchases made by DoD. In the case of Semiconductors, purchases of replacement semiconductors by DoD depot maintenance facilities would be an example of direct defense purchases. "Indirect defense purchases" are purchases, generated throughout the economy, of items used to produce goods bought by DoD. For example, semiconductor chips purchased by a DoD supplier for use in manufacturing a radar ordered by the Navy would be counted as an indirect defense purchase from Semiconductors. Another example of an indirect defense purchase from this industry would be the semiconductors used in switches contained in test equipment bought by a producer of military aircraft.

Semiconductors is a good example of an industry for which defense purchases are primarily indirect. In 1985, for example, DoD is projected to spend about \$124 million on the products of this industry. During that same year, DoD purchases of aircraft, ships, tanks, and many other items will generate a projected \$4.5 billion in indirect purchases of semiconductors--about 36 times the amount projected to be spent on direct defense purchases.

**Table 1. PROJECTED DEFENSE PURCHASES OF  
SEMICONDUCTORS, 1984-1989**

**(In Millions of 1983 dollars)**

							AVG ANN % GROWTH
	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>84 TO 89</u>
<u>Summary</u>							
Defense Purchases							
Direct <sup>a</sup>	106	124	140	157	173	186	11.87
Indirect <sup>b</sup>	<u>3,813</u>	<u>4,516</u>	<u>5,230</u>	<u>5,826</u>	<u>6,280</u>	<u>6,685</u>	<u>11.88</u>
Total	3,919	4,640	5,370	5,984	6,454	6,870	11.88
<u>Indirect Defense Purchases by Purchasing Sector<sup>c</sup></u>							
Missiles	160	189	219	243	265	285	12.29
Ammunition	24	27	32	38	44	50	16.03
Tanks and Tank Components	27	30	33	35	36	37	6.73
Other Ordnance	42	48	53	57	59	62	7.86
Communications Equipment	1,752	2,054	2,356	2,649	2,904	3,113	12.19
Other Electronic Equipment	843	1,031	1,236	1,412	1,550	1,672	14.69
Motor Vehicles	27	32	35	37	39	41	8.67
Aircraft and Parts	593	708	823	868	853	849	7.46
Aircraft Engines and Parts	15	18	20	22	23	24	10.06
Shipbuilding	162	183	203	223	241	262	10.12
All Other	<u>169</u>	<u>196</u>	<u>221</u>	<u>243</u>	<u>265</u>	<u>289</u>	<u>11.27</u>
Total Indirect <sup>d</sup>	3,813	4,516	5,230	5,826	6,280	6,685	11.88
<u>Foreign Military Sales (FMS)<sup>e</sup></u>							
FMS (Direct plus Indirect)	287	244	249	253	259	263	-1.73

### Footnotes for Table 1

a/ Value of purchases by the Department of Defense

b/ Total value of purchases from domestic and foreign sources by manufacturers for incorporation in goods bought by DoD or for use in producing those goods

c/ The composition of these industry groups is shown below, the number in parentheses is the SIC code

Missiles	Complete Missiles (3761)
Ammunition	Ammunition, except Small Arms (3483) Small Arms Ammunition (3482)
Tanks and Tank Components	Tanks and Tank Components (3795)
Other Ordnance	Other Ordnance and Accessories (3489)
Communications Equipment	Telephone and Telegraph Equipment (3661) Radio and Television Communications Equipment (3662)
Other Electronic Equipment	Electronic Computing Equipment (3573) Electronic Measuring Instruments (3825) Electronic and Electronic Equipment except Communications Equipment (3612-3652, 3671-3699)
Motor Vehicles	Truck and Bus Bodies (3713) Truck Trailers (3715) Motor Vehicles (3711) Motor Vehicle Parts and Accessories (3714)
Aircraft and Parts	Aircraft (3721) Aircraft Parts and Equipment (3728)
Aircraft Engines and Engine Parts	Aircraft Engines and Engine Parts (3724)
Shipbuilding	Shipbuilding and Repairing (3731)
All Other	All other four-digit SIC industries

The numbers in parentheses are four-digit Standard Industrial  
Classification (SIC) industries

d/ Numbers may not add to totals due to rounding

e/ Projections of the (constant-dollar) value of production associated with exports of new defense equipment contracted for by foreign governments but managed by DoD contract monitors. Value is net of estimated imports based on the import share of U.S. apparent consumption. Costs of foreign military sales are not funded by the DoD budget

The projected purchases by the 11 aggregate industrial sectors that appear in the middle section of Table 1 are all indirect. Taking the fifth sector (Communications Equipment) as an example, defense purchases of communications equipment and items that include communications equipment are projected to lead producers of communications equipment to buy about \$2.1 billion (1983 dollars) worth of semiconductors in 1985.

Table 1 also displays projected purchases of semiconductors used in the production of military equipment that is sold abroad. These projections include both direct and indirect purchases arising from foreign military sales. Though subject to approval by the federal government, such sales are not funded through the DoD budget. For that reason, purchases generated by them are reported separately from the projections of direct and indirect defense purchases.

### STANDARD INDUSTRIAL CLASSIFICATION SYSTEM

The "industries" for which DEIMS projections are made are those defined in the Standard Industrial Classification (SIC) system. This system, which has undergone many changes, was developed several decades ago to provide federal statistical agencies with a uniform set of categories for gathering and disseminating industrial data.

The SIC classifications are organized hierarchically, starting with broad divisions of the economy and moving to particular products or narrowly defined groups of products. For example Semiconductors fits into the system as follows:

Division D—Manufacturing

Major Group 36—Electrical and Electronic Machinery, Equipment and Supplies

Group 367—Electronic Components and Accessories

Industry 3674—Semiconductors and Related Devices

All of the industries at the fourth level are assigned four digit identification codes and, hence, are often referred to as four digit SIC industries.

Most of the 429 industries for which DEIMS projections are available are at the four digit level, a few, such as 334, Electron Tubes, are combinations of SIC four digit industries. The appendix to this booklet lists the titles of the industries used in DEIMS and provides a reference to the SIC Manual that defines each industrial category.

Table 2--*Sources of Defense Purchases*. Table 2 shows the origins in the DoD budget of demands for the products of specific industries. (The breakdown by military service in the bottom half of the table serves the same function.) The headings in the table correspond to aggregate accounts in the DoD budget: military personnel; operations and maintenance; procurement; research, development, test, and evaluation (RDT&E); and military construction and "all other." Together, these categories span the entire non-pay DoD budget for military functions. (Military and civilian pay do not figure into the projections of defense purchases and so are removed from the accounts in which they appear.)

Since the projections reflect *total* defense purchases--direct plus indirect--they do not indicate whether the buyer will be DoD or a private firm. The projections are intended, rather, to serve as a means of gauging whether defense purchases derive from a relatively small number of programs or, as is the case with semiconductors, are generated by a wide range of programs funded by several budget accounts.

Table 3--*Defense and Nondefense Purchases*. Table 3 is designed to aid comparisons of trends in defense and nondefense purchases. Shown in the first block of items in the table are projections, made by Data Resources Inc. (DRI), of domestic consumption, net imports (imports minus exports), and apparent consumption. (Apparent consumption is the sum of domestic production and net imports.) Also shown is the projected share of apparent consumption supplied by imports.

The middle part of the table presents projections (for comparison to the estimates of total domestic production) of defense purchases from domestic suppliers. "*Domestic* defense purchases" are defined as *total* defense purchases less *imports* for defense production. In the example used, total projected defense purchases of semiconductors amount to about \$4.6 billion, and projected imports in 1985 to roughly \$1.7 billion. (The estimates assume that imports will supply the same share of defense demand as they will of total apparent consumption.) Defense purchases from domestic producers are, therefore, projected to total about \$3.0 billion in 1984.

Shown at the bottom of the table are estimates of the share of total domestic production accounted for by defense purchases. Again using semiconductors as an example, defense purchases are projected to account for about 21 percent of the industry's output in 1985, and for 22 percent in 1989.

*General Characteristics of the Projections*. Some basic characteristics of the DEIMS projections must be borne in mind when reading the three tables:

- The projections are stated in constant, rather than in current, dollars.
- The projections are for calendar years rather than for fiscal years.

**Table 2. SOURCES OF PROJECTED DEFENSE PURCHASES OF  
SEMICONDUCTORS, 1984-1989**  
(In Millions of 1983 dollars)

	1984	1985	1986	1987	1988	1989	AVG ANN % GROWTH 84 TO 89
<u>By Aggregate Budget Category<sup>a</sup></u>							
Military Personnel	8	10	10	11	11	11	7 14
Operations and Maintenance	355	394	430	466	495	520	7 96
Procurement	1,586	1,868	2,187	2,462	2,652	2,810	12 12
Aircraft	592	695	804	845	832	824	6 82
Missiles	338	415	519	616	686	732	16 70
Weapons and Tracked Vehicles	66	74	78	80	80	79	3 73
Ships and Conversions	10	9	11	13	16	18	14 16
Ammunition	161	171	183	198	215	241	8 39
Other	419	503	592	709	824	915	16 94
RDT&E <sup>b</sup>	574	682	758	811	879	940	10 38
Military Construction and Other	<u>4</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>16 13</u>
Total	2,526	2,958	3,390	3,756	4,044	4,289	11 17
<u>Procurement and RDT&amp;E, By Military Service<sup>c</sup></u>							
Army	366	434	499	560	616	664	12 66
Navy <sup>d</sup>	755	838	932	1,025	1,115	1,206	9 81
Air Force	900	1,082	1,246	1,361	1,431	1,476	10 41

<sup>a</sup>The components of these categories are listed in Table 4.

<sup>b</sup>Research, development, test, and evaluation.

<sup>c</sup>For each service, includes the RDT&E and procurement accounts listed in Table 4.

<sup>d</sup>Includes the Marine Corps.



- The projections, which are issued annually in May, are based on the President's budget, submitted to the Congress in January of each year.
- The projections reflect planned DoD *expenditures* during each forecast year. (Expenditures generally differ from appropriations; appropriations usually are voted in a single year, but expended over several years.)
- The projections *exclude* pay costs (that is, salaries and annuities for military and civilian personnel) and the costs of items, such as fuel, bought by DoD abroad.
- The projections reflect DoD expenditures only; they do not include defense-related expenditures of other federal agencies.
- In most cases, the projections are given for four-digit Standard Industrial Classification (SIC) industries or for combinations of such industries.

Neglect of any of these points could lead to serious misinterpretations in comparisons of the DEIMS projections with budget data or with published industry statistics.

**Table 3. PROJECTED DOMESTIC PRODUCTION, DEFENSE PURCHASES,  
AND IMPORTS FOR DEFENSE PRODUCTION OF  
SEMICONDUCTORS, 1984-1989**  
(In Millions of 1983 dollars, except as noted)

	1984	1985	1986	1987	1988	1989	AVG ANN % GROWTH 84 TO 89
Domestic Production	12,891	14,255	15,608	17,065	18,587	19,917	9.09
Plus Net Imports	3,889	4,635	5,416	6,060	6,669	7,257	13.29
Apparent Domestic Consumption	16,780	18,889	21,025	23,125	25,256	27,174	10.12
Import Share (%)	35.5	36.3	36.9	37.2	37.3	37.6	1.11
Defense Purchases	3,919	4,640	5,370	5,984	6,454	6,870	11.88
Less Imports	<u>1,393</u>	<u>1,682</u>	<u>1,980</u>	<u>2,228</u>	<u>2,410</u>	<u>2,581</u>	<u>13.13</u>
Domestic Defense Purchases	2,526	2,958	3,390	3,756	4,044	4,289	11.17
Domestic Defense Purchases as a Share of Domestic Production (%)	19.6	20.7	21.7	22.0	21.8	21.5	1.91

### 3. HOW THE PROJECTIONS ARE MADE: AN OVERVIEW

Projections of direct defense purchases can be derived from DoD planning documents. Direct purchases, however, constitute only part of the total. The average dollar of DoD non-pay outlays generates about an additional dollar in purchases of subassemblies, parts, components, and materials. Though not recorded in the DoD budget or measured in any statistical survey, these indirect defense purchases are clearly at least as important to industry planners and DoD analysts as purchases made directly by DoD.

Figure 1 summarizes how the DEIMS projections are computed. Each of the steps corresponding to the blocks in the figure is discussed in the sections below. In broad terms, the DEIMS projections start with DoD budget data. After some transformations of these data, a "translator" is applied to restate outlays from budget accounts as DoD purchases from each of 429 industries. An input/output table is then used to compute the total defense purchases implied by these direct purchases.

*Basis of the Projections--The DoD Budget.* The DEIMS projections of direct defense purchases are based on planned DoD budgets, completed each December, for each of the five upcoming fiscal years. Listed in Table 4 are the accounts into which, at one level of aggregation, the budget data are grouped. Together, these accounts reflect planned expenditures for all of the military functions of DoD. They do not include the comparatively small amounts budgeted for civil functions of the department (such as public works projects of the Army Corps of Engineers) or for defense programs funded by other federal agencies (principally the Department of Energy).

The budget figures from which the DEIMS projections are derived are those published each January in the *Budget of the United States Government*. As noted earlier, the budget data reflect only the military functions of DoD; defense expenditures by agencies other than DoD and DoD expenditures for civil functions are not included. Because the purpose of the system is to project defense and defense-related demands for the products of U.S. industry, two other categories of expenditures are also removed:

- Military, civilian and retired pay; and
- DoD expenditures made outside the United States.

It is also important to note that the projections are based on outlays, rather than on total obligational authority (TOA) or budget authority (BA). TOA and BA are measures of the dollar amount of new *commitments* into which DoD can enter during a given fiscal year, while outlays measure the dollars actually spent during that year. In the procurement accounts

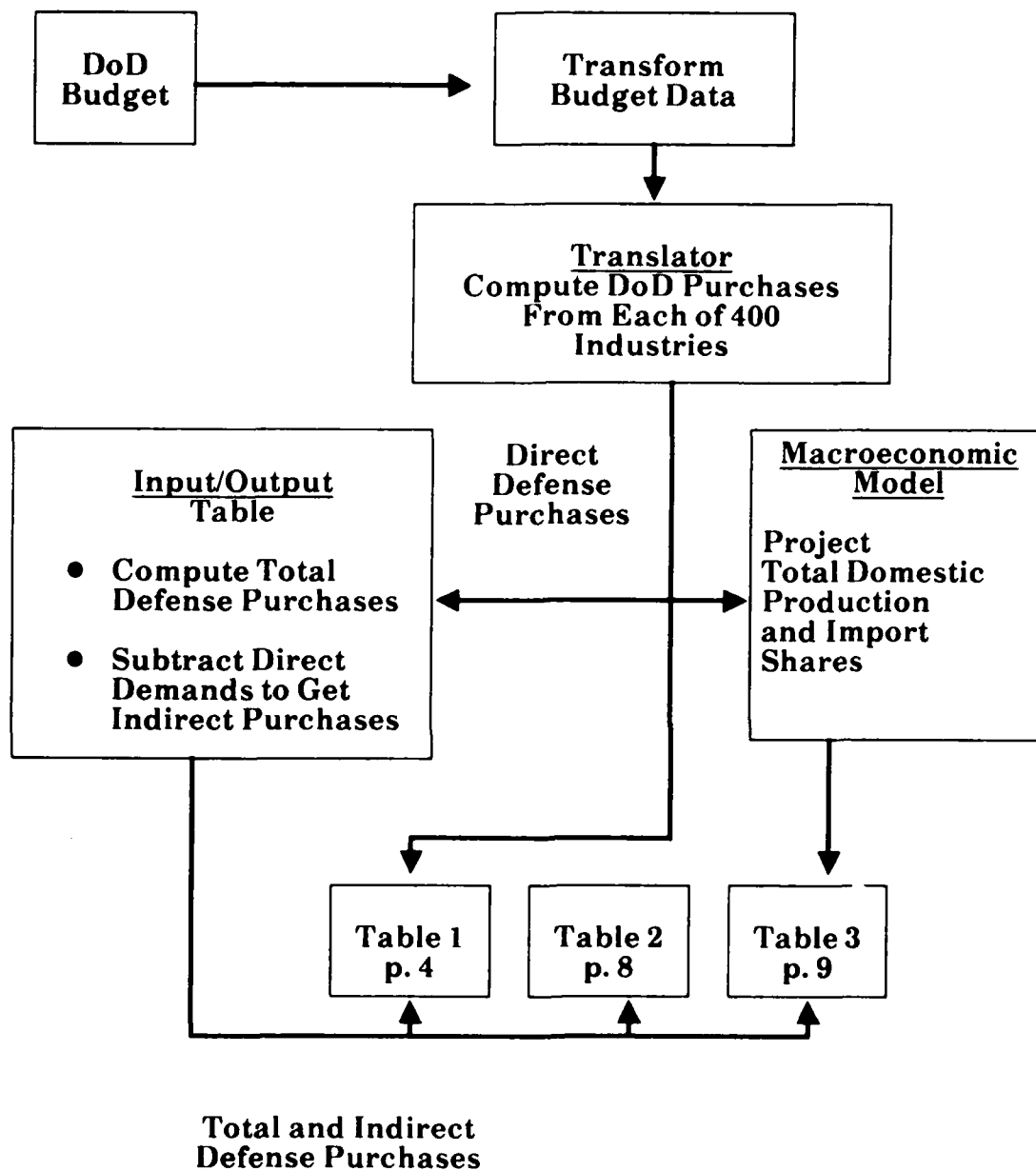


Figure 1. GENERAL FLOW OF DEIMS COMPUTATIONS

**Table 4. DEFENSE DEPARTMENT BUDGET CATEGORIES AS USED IN DEIMS**

Military Personnel	Research, Development, Test and Evaluation
Army	Army
Navy	Navy
Marine Corps	Air Force
Air Force	Defense Agencies
Army Reserve	
Navy Reserve	
Marine Corps Reserve	Operations and Maintenance
Air Force Reserve	Army
Army National Guard	Navy
Air National Guard	Marine Corps
	Air Force
Retired Pay, Military	Defense Agencies
	Army Reserve
Procurement, Army	Navy Reserve
Aircraft	Marine Corps Reserve
Missiles	Air Force Reserve
Weapons and Tracked Vehicles	Army National Guard
Ammunition	Air National Guard
Other	
	Military Construction
Procurement, Navy	Army
Aircraft	Navy
Weapons	Air Force
Ships and Conversions	Defense Agencies
Other	Army Reserve
	Navy Reserve
Procurement, Marine Corps	Air Force Reserve
	Army National Guard
Procurement, Air Force	Air National Guard
Aircraft	
Missiles	Family Housing
Other	
Procurement, Defense Agencies	

(and, to a lesser extent, in the other accounts as well), only a fraction of the amount of a new commitment is actually spent in the year in which the commitment is made; the rest is paid out over several years. Because it is actual expenditures that generate defense purchases, the budget data are restated as outlays for each of the 50 budget accounts on the basis of historical pay-out rates. The resulting estimates of outlays are then deflated to constant 1977 dollars using deflators developed by DoD.

*DoD Purchases--The Translator* The next step in DEIMS starts from the deflated outlay data for each of the 50 budget accounts. Using what is called the "translator," the outlay data are restated as purchases from each of 429 Standard Industrial Classification (SIC) industries. This step is necessary because outlays from any one account are used to pay for purchases from a number of industries.

Table 5 illustrates how the translator for one of the 50 budget accounts listed earlier Navy aircraft procurement--would allocate outlays, in any given year, among various SIC industries. Note that, in this example, only about 39 percent of the outlays go to the aircraft industry.

The translators for all 50 accounts allow the computation, from the budget data described above, of direct defense purchases from each of the 429 industries in the system. These projections are initially computed in constant 1986 dollars for the budget year, but then are restated in dollars of the base year used in calculating the input-output table (1977) using deflators for four-digit SIC industries published by the Bureau of Economic Analysis at the U.S. Department of Commerce.

**Table 5. ESTIMATED DISTRIBUTION AMONG INDUSTRIES  
OF OUTLAYS FROM THE NAVY AIRCRAFT  
PROCUREMENT ACCOUNT, 1984**

<u>Industry<sup>a</sup></u>	<u>Estimated Average Share of Outlays</u>
Other Ordnance and Accessories (3489)	1 86
Electronic Computing Equipment (3573)	6 79
Radio and TV Communication Equipment (3662)	21 18
Aircraft (3721)	38 82
Aircraft Engines and Engine Parts (3724, 3764)	5 03
Aircraft Parts and Equipment NEC (3728, 3769)	8 29
Measuring and Control Instruments (382, except 3825)	1 57
Electric Measuring Instruments (3825)	6 75
All Other	<u>9 71</u>
Total	100 00

<sup>a</sup>Numbers in parentheses are Standard Industrial Classification industry codes

DEIMS also includes a translator for foreign military sales. Estimates of the annual dollar values of such sales for the forecast period are made by DoD. The translator is then used to estimate the direct purchases implied by the dollar figures. Because the purchases will be made by foreign governments rather than by DoD, they are reported separately from the projections of direct defense purchases.

#### INPUT-OUTPUT TABLE

An input/output (I/O) table provides a way of computing the dollar volume of various "inputs" required to produce a specified set of "outputs." In the table used in DEIMS, both "inputs" and "outputs" are defined in terms that correspond closely to the products of four digit Standard Industrial Classification (SIC) industries. (See the box on page 6 on SIC industries.) "Outputs" (that is, direct defense purchases) are stated in terms of 1977 dollars because the I/O table used was built using prices stated in dollars of that year.

The I/O table consists of 429 columns, one for each of the commodities for which the DEIMS projections are prepared. The numbers in the columns indicate the shares of purchases made of commodities from each industry (for example, aircraft). An industrial establishment or company may produce more than one commodity or product. The primary product produced at each location defines the SIC category of the establishment. The DEIMS I/O is a commodity based I/O and not an establishment based one. Thus, the shares represent the fractions of total purchases (to produce a given commodity output) which are spent on the various commodity inputs.

The DEIMS translator converts data on DoD outlays to "outputs" for the I/O table, which is then used to estimate the total amount of the products of each industry group that must be produced to supply those outputs. Conceptually, the computations are a matter of tracing through the large number of production pathways implicit in the table (for example, aircraft to landing gear to nonferrous forgings, aircraft to aircraft engines to nonferrous forgings, aircraft to aircraft engines to machine tools to nonferrous forgings, and so on). The computations are far too extensive to do by hand but can easily be done with the aid of a computer.

Total Defense Demands DEIMS uses an input/output (I/O) table that distinguishes among 429 product groups, which collectively span all of the goods and services legally produced in the economy. (The box above describes what an I/O table is.) Since most of the product groups in the I/O table correspond to SIC industries, the discussion here has referred to "industries" rather than to "product groups." (A listing of the industries in the I/O table begins on p 23.)

The projections of total defense purchases are made using a 429-sector input/output model developed by Data Resources Inc. The estimates of direct defense purchases on which the projections are based are prepared by DoD. Like virtually all large I/O models of the U.S. economy, DRI's is based on the 1977 input/output table prepared by the Department of Commerce. The unique features of the DRI model (and of other I/O models) lie in the way in which the 1977 coefficients are updated to account for such factors as technological change and changes in the product mix within the various industrial sectors.

The I/O table is used 21 times in DEIMS, for the direct DoD purchases associated with:

- the DoD budget as a whole;
- each of 10 aggregate DoD budget accounts; and
- each of 10 aggregate industrial sectors.

The first application of the table yields projections of total and indirect defense purchases (Table 1). (Indirect defense purchases are calculated by subtracting direct defense purchases from total defense purchases.) The remaining applications disaggregate defense purchases by budget category and by military service (Table 2).

*Total Domestic Production - Defense Imports.* The DEIMS reports include projections, made by DRI, of total domestic production (Table 3). The projections are derived from two types of data: the DoD budget data used in DEIMS and data on the Administration's planned expenditures for nondefense programs. The other assumptions underlying the projections are those made by DRI in its published baseline forecasts. DoD does not endorse these forecasts, or those of any other forecasting firm, and offers them only as benchmarks for comparison with defense purchases.

The projections reported for *domestic* defense purchases (also shown in Table 3) are calculated by subtracting estimates of imports used to produce defense purchases from total defense purchases. (The estimates of defense imports are computed on the assumption that imports will supply the same share of defense purchases as they do of total apparent consumption.) The import share of total apparent consumption for each year in the forecast period is computed from DRI projections of imports and consumption. The estimates of imports for defense should be used with caution, as the share of defense purchases made abroad could prove to be quite different from the import share of total apparent consumption.

#### 4. HOW THE PROJECTIONS ARE MADE: THE TRANSLATOR

The preceding section described what the translator *does*. In summary, the translator breaks down outlays from 50 budget categories into DoD purchases from various industries. But what is it? Is the translator fundamentally a classification procedure? Or is it an economic model?

The answer is "both." The translator works as an approximate crosswalk between budget accounts and industries, but it also provides information on the inputs used in manufacturing major weapons systems.

*The Translator as a Classification Procedure.* A DEIMS "translator" is made up of estimates of the shares of outlays from individual budget accounts that go to purchase the products of various industries. Applied to planned outlays from those accounts, the translator yields dollar estimates of DoD purchases from various Standard Industrial Classification (SIC) industries.

Behind each of the 50 DoD budget accounts listed in Table 4 are from a few dozen to a few thousand subaccounts. In many cases, all of the outlays from a given subaccount go to a single SIC industry. For example, 100 percent of the purchases of replacement jet engines are made from SIC 3724, Aircraft Engines and Parts. Subaccounts that fund substantial purchases from two or more industries must be disaggregated further, but reasonable estimates of the breakdown--if not exact figures--can be obtained from program descriptions, historical patterns of expenditures, or the judgment of program managers.

Sorting through and disaggregating the various subaccounts could be done by hand, but the process would be so time-consuming that projections of defense demand could not be updated annually to reflect changes in the defense budget. Consequently, to keep the projections current, a faster and more efficient means of classifying defense purchases by industrial sector had to be developed. That is one of the basic functions of the translator.

The translator automates the classification process for the procurement accounts. In these cases, DEIMS uses budgeted amounts in the subaccounts for each year of the forecast horizon and each subaccount includes a "subtranslator" composed of estimates of the shares of outlays from that subaccount going for the products of various industries. The translators for the aggregate accounts (Navy aircraft procurement) are built up from subtranslators for the subaccounts (F/A-18 aircraft). The aggregate translators vary from one year of the forecast period to the next as the mix of items funded by the account changes.



The translators for the operations and maintenance (O&M) and military construction (MILCON) accounts are not adjusted year by year. These translators were computed using detailed budget data (for FY 1982) that distinguished among several thousand categories of purchases (for example, costs of operating repair depots, architectural and engineering services, various types of spare parts). Outlays from individual subaccounts, sometimes after further disaggregation, were classified by SIC industry (for example, truck parts to SIC 3714, Motor Vehicle Parts and Accessories). The dollar figures were then used to compute shares of total outlays from the aggregate accounts in FY 1982. The use of translators computed from FY 1982 budget data to project purchases in subsequent years rests on the assumption that the distribution of outlays from the O&M and MILCON accounts across industries remains relatively stable over time.

The translators for the RDT&E accounts, like those for the O&M and MILCON accounts, are constant over the forecast period. The RDT&E translators, however, reflect planned purchases over the period 1983-1987 rather than actual purchases during a historical year.

*The Translator as a Model.* The translator works as a classification technique to the extent that it takes planned outlays from individual budget accounts and sorts them among the various SIC industries from which purchases will be made. The translator serves as a model to the extent that it breaks down the cost of *complete products*--such F/A-18 aircraft--into purchases from various industries.

The translator is set up to "unbundle" the costs (as they appear in the budget) of major weapons systems. For example, the costs of Navy aircraft are broken out into purchases from the following SIC industries (c.f. Table 5):

- Aircraft;
- Aircraft Engines and Engine Parts;
- Aircraft Parts and Equipment NEC;
- Other Ordnance and Accessories;
- Radio and TV Communications Equipment;
- Electric Measuring Instruments;
- Measuring and Control Instruments;
- Electronic Computing Equipment.

Purchases from these industries are used in place of a single purchase from the aircraft industry when the I/O table is applied to compute total defense purchases.

This practice was adopted in response to unreasonable results, obtained in early trials of DEIMS, for some categories of purchases arising from the procurement of aircraft and missiles. For example, the projections of purchases of aircraft engines (due to DoD purchases of aircraft) were only about half the amounts implied by budget data. Those unreasonable results occurred because the I/O table used to make the projections did not accurately describe the pattern of inputs to major weapons systems. Continuing the example, on average engines

account for about 10 to 15 percent of the cost of military aircraft. But the I/O table used attributed a much smaller share (only about 5 percent) of aircraft cost to engines.

The problems with the I/O table were, in turn, traced to the way government furnished equipment (GFE) is accounted for in computing the coefficients in the I/O table. Returning to the example of aircraft engines, the relevant I/O coefficient should be--but because of accounting conventions is not--the share of cost accounted for by engines. Engines purchased by aircraft manufacturers are counted as part of the costs of aircraft production. For both military and large civilian aircraft, however, the engines typically are not bought by the aircraft manufacturer: they are purchased (from the engine producer) by the buyer of the aircraft and shipped to the aircraft manufacturer for installation. In the data used to construct the I/O table, these purchases of engines are not treated as inputs to aircraft production. Consequently, the computed I/O coefficient is substantially less than the actual share of aircraft cost accounted for by engines.

This problem was dealt with by developing input coefficients that more accurately reflect the input requirements of major weapons systems. In effect, DEIMS uses an I/O table modified to reflect the unique input requirements of major weapons systems.

Unbundling of the costs of major weapons systems into purchases from various industries (as described above) is the first step in developing the modified input coefficients. In general terms, the unbundled cost shares are substituted for the corresponding I/O coefficients and the other coefficient appropriately adjusted. A technical description of the process appears in Institute for Defense Analyses, The Defense Translator, Appendix B, (IDA Record Document D-62, June 1984).

One other problem must be noted. The translators for the procurement accounts separate out shares of purchases of selected products (e.g., electronics) whether the costs represent GFE or contractor furnished equipment (CFE). This is done for the reason already indicated--to permit more accurate estimates of the total requirements for production of major weapons systems. But this procedure misclassifies some purchases of CFE as direct defense purchases. A final step in DEIMS (done after the computations with the I/O table have been completed) shifts some direct purchases, representing CFE, to indirect purchases using information derived from the input output table. This correction, however, is only approximate, and in a few cases there is some ambiguity in the classification of defense purchases between "direct" and "indirect" (This problem arises primarily for military electronics.)

## 5. SOURCES OF UNCERTAINTY IN THE PROJECTIONS

This section describes the sources of uncertainty in the DEIMS projections of direct defense purchases. The projections of total defense purchases and of total domestic production of each industry in the system, which involve different considerations, are not discussed.

The projections of direct defense purchases rely on five types of information.

- Estimates of *total obligational authority* for each of the 50 budget accounts for each of the five upcoming fiscal years;
- Historical *pay-out rates for each budget account*, which are used to convert total obligational authority to outlays;
- *Deflators for each budget account*, which are used to restate the outlays in terms of 1977 dollars;
- The *translators*, which trace the flow of purchases from each outlay account to the industrial sectors in which the purchases are made; and
- *Deflators for each industry*, which are used to convert the projections from 1977 dollars to dollars of a more recent year.

Though there is some potential for error in each of these items, the major sources of uncertainty in the projections are the underlying budget data and the translator.

A useful way to put uncertainty in planned DoD budgets into perspective is to ask: Is there more uncertainty in planned defense spending over a five-year horizon than there is in five-year forecasts of such variables as gross national product (GNP) and the index of industrial production? The answer is very probably "no."

Some indication of the variability of defense purchases from particular industries is provided by examining the number of budget accounts that fund those purchases (see Table 2). To the extent that planned purchases are broadly derived, variations in those purchases are likely to track nonpay defense outlays as a whole. Conversely, if the purchases are funded by only a few accounts, attention is directed to uncertainty in the particular programs behind those purchases.

The DEIMS translator has two helpful properties. First, it does not magnify errors in the projections arising from differences between planned and actual spending. On the contrary, errors in the projections of direct defense purchases are proportional to the difference between actual spending in the programs giving rise to those purchases and

planned spending at the time the projections were made. Second, a change in spending on a given program does not affect projected purchases for unrelated items.

The distribution of DoD purchases among industries changes over time in response to:

- shifts in the composition of defense outlays (an increase in the share of the budget going for procurement, for example), and
- changes, within individual budget accounts, in the share of outlays going to various industries.

The first of these, which is also the primary source of change, is picked up by the translator. The second, "within account" variations, is picked up for the procurement accounts and, approximately, for the RDT&E accounts. The translators for the O&M and MILCON accounts do not pick up "within account" variations in the distribution of outlays across industries, but such variations are generally small. In sum, the translator does a reasonably good job of capturing shifts in the distribution of outlays across industries.

Beyond these general points, uncertainties in the projections of direct defense purchases can be assessed only on an industry-by-industry basis.

About 61 percent of direct defense purchases are accounted for by 10 industries. For each of those industries, the DEIMS projections issued in 1983 have been compared with relevant published information; in many cases, they have been discussed with knowledgeable people in the industry. On that basis, the projections appeared to be reasonable. Nonetheless, these subjective judgments are not conclusive, and the projections are continuously under review. The Defense Department invites your participation in this process, through the DoD contacts listed on the front cover of this booklet and the feedback form at the end.

## CODES FOR ORDERING DEIMS PROJECTIONS

The following pages provide a list of the 429 industries for which DEIMS projections of DoD purchases and total defense purchases are available. (An *index of major industry groups* precedes the listing). To order projections, simply complete the form attached at the end of this booklet. Be sure to include the order numbers for the projections you are requesting.

For a listing of the definitions of various SIC industries, see:

U.S. Office of Management and Budget, *Standard Industrial Classification Manual* (Stock Number 041-001-00066-6), U.S. Government Printing Office, Washington, D.C., 20402.

For an explanation of how the industry sectors in the input/output table used in DEIMS correspond to SIC industries, see pages 2-3 of:

U.S. Department of Commerce, Bureau of Economic Analysis, *The Detailed Input-Output Structure of the U.S. Economy: 1972* (Stock Number 003-010-00064-3), Government Printing Office, Washington, D.C. 20402.

Industry Group	Page
Agriculture, Forestry, and Fisheries .....	25
Mining .....	25
Construction .....	25
Ordinance and Accessories .....	26
Food and Kindred Products .....	27
Tobacco Manufacturers .....	28
Textiles and Apparel .....	28
Lumber and Wood Products .....	29
Furniture and Fixtures .....	29
Paper and Allied Products .....	30
Printing and Publishing .....	30
Chemicals and Allied Products .....	31
Petroleum and Coal Products .....	31
Rubber and Plastics Products NEC .....	31
Leather and Leather Products .....	32
Glass, Stone, and Clay Products .....	32
Primary Metals .....	32
Fabricated Metal Products .....	33
Machinery, Except Electrical .....	34
Electric and Electronic Equipment .....	36
Transportation Equipment .....	37
Instruments and Related Products .....	38
Miscellaneous Manufacturing .....	38
Transportation and Communication .....	39
Utilities .....	39
Trade .....	39
Finance, Insurance, and Real Estate .....	39
Services NEC .....	40
Government and Other .....	41

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
<b>AGRICULTURE, FORESTRY, AND FISHERIES</b>			
1	Dairy Farm Products	010100	
2	Poultry & Eggs	010200	
3	Livestock	010301, 010302	
4	Cotton	020100	
5	Food Grains	020201	
6	Feed Grains & Grass Seed	020202, 020203	
7	Tobacco	020300	
8	Fruits & Nuts	020400, 020401102	
9	Vegetables	020501	
10	Miscellaneous Crops	020502, 020503, 020702	
11	Oil Bearing Crops	020600	
12	Forestry Products	030001	
13	Fishery Products	030002	
14	Agricultural, Forestry & Fishery Services	040001, 040002	
<b>MINING</b>			
15	Iron & Ferroalloy Ores Mining	050000	101, 106
16	Copper Ore Mining	060100	102
17	Metal Ores Mining, N.E.C.	060200	103-105, Pt. 108, 109
18	Coal Mining	070000	1111, Pt. 1112, 1211, Pt. 1213
19	Crude Petroleum	080000	131, 132, Pt. 138
20	Natural Gas	080000	
21	Stone/Clay Mining & Quarrying	090001, 090002, 090003, 090004	141-5, Pt. 148, 149
22	Chemical & Fertilizer Mineral Mining	100000	147
<b>CONSTRUCTION</b>			
23	New Residential Single Family Housing	110101, 110501	Pt. 15, Pt. 17
24	New Residential Multifamily Housing	110102, 110103, 110104	Pt. 15-17
25	New Residential Additions & Alterations	110105	Pt. 15, Pt. 17

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
26	New Hotels, Motels, & Dormitories	110106, 110107	Pt. 15-17
27	New Industrial Buildings	110201	Pt. 15-17
28	New Office Buildings	110202	
29	New Commercial Buildings, ex Office Buildings	110202, 110203 110204, 110205	Pt. 15, Pt. 17
30	New Religious Buildings	110206	Pt. 15, Pt. 17
31	New Educational Buildings	110207	Pt. 15, Pt. 17
32	New Hospital & Institutional Buildings	110231, 110232	Pt. 15, Pt. 17
33	New Telephone & Telegraph Facilities	110301	Pt. 16, Pt. 17
34	New Railroads	110302	Pt. 16, Pt. 17
35	New Electric Utility Facilities	110303	Pt. 16, Pt. 17
36	New Gas Utility Facilities	110304	Pt. 16, Pt. 17
37	New Petroleum Pipelines	110305	Pt. 16, Pt. 17
38	New Water Supply Facilities	110306	Pt. 16, Pt. 17
39	New Sewer Facilities	110307	Pt. 16, Pt. 17
40	New Highways & Streets	110400	Pt. 16, Pt. 17
41	New Farm Service Facilities	110502	Pt. 15, Pt. 17
42	New Oil & Gas Wells Drilling	110601	Pt. 138, Pt. 108,
43	Exploration & Solid Access Structures: Mining	110602, 110603	Pt. 1112, Pt. 1213 Pt. 148
44	New Military Facilities	110701	Pt. 15-17
45	New Conservation & Development Facilities	110702, 110703	Pt. 15-17
46	New Construction, N.E.C.	110241, 110250, 110308, 110704	Pt. 15-17, Pt. 108, Pt. 1112, Pt. 1213, Pt. 148
47	Maintenance & Repair, Residential	120100	Pt. 15, Pt. 17
48	Maintenance & Repair, Private Non Res.	120201-8, 120215-16	Pt. 15-17, Pt. 138
49	Maintenance & Repair, Public	120209-14	

## ORDNANCE AND ACCESSORIES

50	Complete Guided Missiles	130100	3761
51	Ammunition, Except Small Arms, N.E.C.	130200	3483



### ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
52	Tanks & Tank Components	130300	3795
53	Small Arms	130500	3484
54	Small Arms Ammunition	130600	3482
55	Other Ordnance & Accessories	130700	3489

### FOOD AND KINDRED PRODUCTS

56	Meat Packing Plants	140101	2011
57	Other Prepared Meats	140102	2013
58	Poultry Dressing Plants	140103	2016
59	Poultry & Egg Processing	140104	2017
60	Creamery Butter	140200	2021
61	Cheese, Natural & Processed	140300	2022
62	Condensed & Evaporated Milk	1404001	2023
63	Ice Cream & Frozen Desserts	140500	2024
64	Fluid Milk	140600	2026
65	Canned & Cured Seafoods	140700	2091
66	Canned Specialties	140800	2032
67	Canned Fruits & Vegetables	140900	2033
68	Dehydrated Food Products	141000	2034
69	Pickles, Sauces & Salad Dressings	141100	2035
70	Fresh or Frozen Packaged Fish	141200	2092
71	Frozen Fruits & Vegetables, Juices	141301 141302	2037, 2038
72	Flour & Other Grain Mill Products	141401	2041
73	Cereal Preparations	141402	2043
74	Blended & Prepared Flour	141403	2045
75	Pet Food	141501	2047
76	Prepared Feed, N.E.C.	141502	2048
77	Rice Milling	141600	2044
78	Wet Corn Milling	141700	2046
79	Bread, Cake & Related Products	141801	2051
80	Cookies & Crackers	141802	2052
81	Sugar	141900	2061, 2062, 2063
82	Confectionery Products	142001	2065

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
83	Chocolate & Cocoa Products	142002	2066
84	Chewing Gum	142003	2067
85	Malt Liquors	142101	2082
86	Malt	142102	2083
87	Wines, Brandy & Brandy Spirits	142103	2084
88	Distilled Liquor, Except Brandy	142104	2085
89	Bottled & Canned Soft Drinks	142200	2086
90	Flavoring Extracts & Syrups, N.E.C.	142300	2087
91	Cottonseed Oil Mills	142400	2074
92	Soybean Oil Mills	142500	2075
93	Vegetable Oil Mills, N.E.C.	142600	2076
94	Animal & Marine Fats & Oils	142700	2077
95	Roasted Coffee	142800	2095
96	Shortening & Cooking Oils	142900	2079
97	Manufactured Ice	143000	2097
98	Macaroni & Spaghetti	143100	2098
99	Food Preparations, N.E.C.	143200	2099

## TOBACCO MANUFACTURERS

100	Cigarettes	150101	2111
101	Cigars	150102	2121
102	Chewing & Smoking Tobacco	150103	2131
103	Tobacco Stemming & Redrying	150200	2141

## TEXTILE & APPAREL

104	Broadwoven Fabric Plants	160100	2211, 2221, 2231, 2261, 2262
105	Narrow Fabric Mills	160200	2241
106	Yarn Mills & Textile Finishing	160300	2269, 2281, 2282, 2283
107	Thread Mills	160400	2284
108	Floor Coverings	170100	2271, 2272, 2279
109	Miscellaneous Textile Products	170200, 170203-6	2291-2295
110	Tire Cord & Fabric	170700	2296
111	Textile Goods, N.E.C.	170900, 171001, 171002	2297-2299

### ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
112	Hosiery & Knit Goods	180101-2, 180201-3	2251-2254, 2259
113	Knit Fabric Mills	180300	2257, 2258
114	Apparel from Purchased Material	180400	231-8, 39996
115	House Furnishings (Inc. Curtains)	190100, 190200	2391, 2392
116	Fabric Textile Products, N.E.C.	190301-6	2393-2397, 2399

#### LUMBER & WOOD PRODUCTS

117	Logging Camps & Contractors	200100	2411
118	Sawmills & Planing Mills, General	200200	2421
119	Hardwood Dimension & Flooring	200300	2426
120	Special Product Sawmills, N.E.C.	200400	2429
121	Millwork	200501	2431
122	Wood Kitchen Cabinets	200502	2434
123	Veneer & Plywood	200600	2435, 2436
124	Structural Wood Members, N.E.C.	200701	2439
125	Prefabricated Wood Structures	200702	2452
126	Wood Preserving	200800	2491
127	Wood Pallets & Skids	200901	2448
128	Particleboard	200902	2492
129	Wood Products, N.E.C.	200903	2499
130	Wooden Containers	210000	2441, 2449

#### FURNITURE AND FIXTURES

131	Wood Household Furniture	220101	2511
132	Household Furniture, N.E.C.	220102	2519
133	Wood Television & Radio Cabinets	220103	2517
134	Upholstered Household Furniture	220200	2512
135	Metal Household Furniture	220300	2514
136	Mattresses & Bedsprings	220400	2515

### ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
137	Wood Office Furniture	230100	2521
138	Metal Office Furniture	230200	2522
139	Public Building Furniture	230300	2531
140	Wood Partitions & Fixtures	230400	2541
141	Metal Partitions & Fixtures	230500	2542
142	Venetian Blinds & Shades	230600	2591
143	Furniture & Fixtures, N.E.C.	230700	2599

#### PAPER & ALLIED PRODUCTS

144	Pulp Mills	240100	2611
145	Paper Mills, Except Building Paper	240200	2621
146	Paperboard Mills	240300	2631
147	Envelopes	240400	2642
148	Sanitary Paper Products	240500	2647
149	Building Paper & Board Mills	240602	2661
150	Paper Coating & Glazing	240701	2641
151	Bags, Except Textile Bags	240702	2643
152	Die-Cut Paper & Board	240703	2645
153	Pressed & Molded Pulp Goods	240704	2646
154	Stationary & Misc. Converted Products	240704-5	2648-9
155	Paperboard Containers & Boxes	250000	265

#### PRINTING & PUBLISHING

156	Newspapers	260100	2711
157	Periodicals	260200	2721
158	Book Publishing	260301	2731
159	Book Printing	260302	2732
160	Miscellaneous Publishing	260400	2741
161	Commercial Printing	260501	2751, 2752, 2754
162	Manifold Business Forms	260601	2761
163	Blankbooks & Looseleaf Binders	260602	2782
164	Greeting Card Publishing	260700	2771
165	Engraving & Plate Printing	260801	2753
166	Bookbinding & Related Work	260802	2789
167	Printing Trade Services	260502, 260803-260805	2791, 2793, 2794, 2795

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
<b>CHEMICALS &amp; ALLIED PRODUCTS</b>			
168	Inorganic & Organic Chemicals	270100	2812, 2813, 2816, 2819 exc 28195, 2865, 2869
169	Fertilizers	270201	2873, 2874
170	Fertilizers, Mixing Only	270202	2875
171	Agricultural Chemicals, N.E.C.	270300	2879
172	Gum & Wood Chemicals	270401	2861
173	Adhesives & Sealants	270402	2891
174	Explosives	270406	2892
175	Printing Ink	270403	2893
176	Carbon Black	270404	2895
177	Chemical Preparations, N.E.C.	270405	2899
178	Plastic Materials & Resins	280100	2821
179	Synthetic Rubber	280200	2822
180	Cellulosic Man-Made Fibers	280300	2823
181	Organic Fibers, Noncellulosic	280400	2824
182	Drugs	290100	2831, 2833, 2834
183	Soap & Other Detergents	290201	2841
184	Polishes & Sanitation Goods	290202	2842
185	Surface Active Agents	290203	2843
186	Toilet Preparations	290300	2844
187	Paints & Allied Products	300000	2951
<b>PETROLEUM AND COAL PRODUCTS</b>			
188	Petroleum Refining	310101	2911
189	Lubricating Oils & Greases	310102	2992
190	Products of Petroleum & Coal, nec	310103	2999
191	Paving Mixtures & Blocks	310200	2951
192	Asphalt Felts & Coatings	310300	2952
<b>RUBBER AND PLASTICS PRODUCTS, N.E.C.</b>			
193	Tires & Inner Tubes	320100	3011
194	Rubber & Plastics Footwear	320200	3021
195	Reclaimed Rubber	320301	3031
196	Fabricated Rubber Products, N E C	320302	3069

## ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
197	Miscellaneous Plastic Products	320400	3079
198	Hose & Belting	320500	3041

### LEATHER & LEATHER PRODUCTS

199	Leather Tanning & Finishing	330001	3111
200	Footwear, Cut Stock	340100	3131
201	Footwear, N.E.C.	340201-2	3142-3144, 3149
202	Leather Gloves & Mittens	340301	3151
203	Luggage	340302	3161
204	Leather Goods, N.E.C.	340303-5	3171, 3172, 3199

### GLASS, STONE & CLAY PRODUCTS

205	Glass & Products, Except Containers	350100	3211, 3229, 3231
206	Glass Containers	350200	3221
207	Cement, Hydraulic	360100	3241
208	Structural Clay Products	360200-360500	325
209	Kitchen Pottery	360701-2, 360900	3262-3, 3269
210	Porcelain Plumbing & Electrical Supply	360600, 360800	3261, 3264
211	Concrete Block & Brick	361000	3271
212	Concrete Products, N.E.C.	361100	3272
213	Ready-Mixed Concrete	361200	3273
214	Lime	361300	3274
215	Gypsum Products	361400	3275
216	Cut Stone & Stone Products	361500	3281
217	Abrasive Products	361600	3291
218	Asbestos Products & Sealing Devices	361700, 361800	3292, 3293
219	Minerals, Ground or Treated	361900	3295
220	Mineral Wool	362000	3296
221	Nonclay Refractories	362100	3297
222	Nonmetallic Mineral Products, N E C	362200	3299

### PRIMARY METALS

223	Blast Furnaces & Steel Mills	370101	3312
224	Electrometallurgical Products	370102	3313
225	Steel Wire & Related Products	370103	3315

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
226	Cold Finishing Steel Shapes	370104	3316
227	Steel Pipe & Tubes	370105	3317
228	Iron & Steel Foundries	370200	3321, 3322, 3324, 3325
229	Iron & Steel Forgings	370300	3462
230	Metal Heat Treating	370401	3398
231	Primary Metal Products, N.E.C.	370402	3399
232	Primary Copper	380100	3331
233	Primary Lead	380200	3332
234	Primary Zinc	380300	3333
235	Primary Aluminum	380400	3334
236	Primary Nonferrous Metals, N.E.C.	380500	3339
237	Secondary Nonferrous Metals	380600	3341
238	Copper Rolling & Drawing	380700	3351
239	Aluminum Rolling & Drawing N.E.C.	380800	3353, 3354, 3355
240	Nonferrous Rolling & Drawing, N.E.C.	380900	3356
241	Nonferrous Wire Drawing & Insulating	381000	3357
242	Aluminum Castings	381100	3361
243	Brass, Bronze & Copper Castings	381200	3362
244	Nonferrous Castings, N.E.C.	381300	3369
245	Nonferrous Forgings	381400	3463

## FABRICATED METAL PRODUCTS

246	Metal Cans	390100	3411
247	Metal Barrels, Drums & Pails	390200	3412
248	Metal Sanitary Ware	400100	3431
249	Plumbing Fittings & Trim	400200	3432

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
250	Heating Equipment, Except Electrical	400300	3433
251	Fabricated Structural Metal	400400	3441
252	Metal Doors, Sash & Trims	400500	3442
253	Fabricated Plate Work (Boilershop)	400600	3443
254	Sheet Metal Work	400700	3444
255	Architectural Metal Work	400800	3446
256	Miscellaneous Metal Work & Prefab. Metal Buildings	400901, 400902	3448, 3449
257	Screw Machine Products & Fasteners	410100	345
258	Automotive Stampings	410201	3465,
259	Other Metal Stampings	410202-03	3466, 3469
260	Cutlery	420100	3421
261	Hand & Edge Tools, N.E.C.	420201	3423
262	Hand Saws & Saw Blades	420202	3425
263	Hardware, N.E.C.	420300	3429
264	Plating & Polishing	420401	3471
265	Metal Coating & Allied Services	420402	3479
266	Miscellaneous Fabricated Wire Products	420500	3495, 3496
267	Steel Springs	420700	3493
268	Pipe Valves & Pipe Fittings	420800	3494, 3498
269	Metal Foil & Leaf	421000	3497
270	Fabricated Metal Products, N.E.C.	421100	3499

## MACHINERY, EXCEPT ELECTRICAL

271	Steam Engines & Turbines	43010	3511
272	Internal Combustion Engines, N.E.C.	430200	3519
273	Farm Machinery	440001	3523



# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
274	Lawn & Garden Equipment	440002	3524
275	Construction Machinery	450100	3531
276	Mining Machinery, Except Oil	450200	3532
277	Oil Field Machinery	450300	3533
278	Elevators & Moving Stairways	460100	3534
279	Conveyors & Conveying Equipment	460200	3535
280	Hoists, Cranes & Monorails	460300	3536
281	Industrial Trucks & Tractors	460400	3537
282	Machine Tools, Metal Cutting	470100	3541
283	Machine Tools, Metal Forming	470200	3542
284	Special Dies, Tools, Accessories	470300	3544, 3545
285	Power Driven Hand Tools	470401	3546
286	Rolling Mill Machinery	470402	3547
287	Metalworking Machinery, N.E.C.	470403	3549
288	Food Products Machinery	480100	3551
289	Textile Machinery	480200	3552
290	Woodworking Machinery	480300	3553
291	Paper Industries Machinery	480400	3554
292	Printing Trades Machinery	480500	3555
293	Special Industry Machinery, N.E.C.	480600	3559
294	Pumps & Compressors	490100	3561, 3563
295	Ball & Roller Bearings	490200	3562
296	Blowers & Fans	490300	3564
297	Industrial Patterns	490400	3565
298	Power Transmission Equipment	490500	3566, 3568
299	Industrial Furnaces & Ovens	490600	3567
300	General Industrial Machinery, N.E.C.	490700	3569

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
301	Carburetors, Pistons, Piston Rings & Valves	500001	3592
302	Miscellaneous Machinery	500002	3599
303	Electronic Computing Equipment	510101	3573
304	Calculating & Accounting Machinery	510102	3574
305	Scales & Balances	510300	3576
306	Office Machines, N.E.C.	510400	3579
307	Automatic Merchandising Machinery	520100	3581
308	Commercial Laundry Equipment	520200	3582
309	Refrigeration & Heating Equipment	520300	3385
310	Measuring & Dispensing Pumps	520400	3586
311	Service Industry Machinery, N.E.C.	520500	3589

## ELECTRIC AND ELECTRONIC EQUIPMENT

312	Electric Measuring Instruments	530100	3825
313	Transformers	530200	3612
314	Switchgear & Switchboards	530300	3613
315	Motors & Generators	530400	3621
316	Industrial Controls	530500	3622
317	Welding Apparatus	530600	3623
318	Carbon & Graphite Products	530700	3624
319	Electric Industrial Apparatus, N.E.C.	530800	3629
320	Household Cooking Equipment	540100	3631
321	Household Refrigerators & Freezers	540200	3632
322	Household Laundry Equipment	540300	3633
323	Electric Housewares & Fans	540400	3634
324	Household Vacuum Cleaners	540500	3635
325	Sewing Machines	540600	3636
326	Household Appliances, N.E.C.	540700	3639

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
327	Electric Lamps	550100	3641
328	Lighting Fixtures	550200	3645, 3646, 3647, 3648
329	Wiring Devices	550300	3643, 3644
330	Radio & Television Receiving Sets	560100	3651
331	Phonograph Records & Tape	560200	3652
332	Telephone & Telegraph Equipment	560300	3661
333	Radio & Television Communication Equipment	560400	3662
334	Electron Tubes	570100	3671, 3672, 3673
335	Semiconductors	570200	3674
336	Electronic Capacitors	570300	3675
337	Resistors, for Electronic Applications	570300	3676
338	Electronic Coils, Transformers and Other Inductors	570300	3677
339	Connectors for Electronic Applications	570300	3678
340	Electronic Components, N. E. C.	570300	3679
341	Storage Batteries	580100	3691
342	Primary Batteries, Dry & Wet	580200	3692
343	X-Ray Apparatus & Tubes	580300	3693
344	Engine Electrical Equipment	580400	3694
345	Electrical Equipment, N. E. C.	580500	3699

## TRANSPORTATION EQUIPMENT

346	Truck & Bus Bodies	590100	3713
347	Truck Trailers	590200	3715
348	Motor Vehicles-Autos	590301	3711
359	Motor Vehicles-Other	590301	3711
350	Motor Vehicle Parts & Accessories	590302	3714
351	Aircraft	600100	3721

### ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
352	Aircraft Engines & Engine Parts	600200	3724, 3764
353	Aircraft Parts & Equipment, N.E.C.	600400	3728, 3769
354	Shipbuilding & Repairing	610100	3731
355	Boatbuilding & Repairing	610200	3732
356	Railroad Equipment	610300	3743
357	Motorcycles, Bicycles & Parts	610500	3751
358	Travel Trailers & Campers	610601, 03	3792
359	Mobile Homes	610602	2451
360	Transportation Equipment, N.E.C.	610700	3799

### INSTRUMENTS AND RELATED PRODUCTS

361	Engineering & Scientific Instruments	620100	3811
362	Measuring & Control Instruments	620200, 620300	382, exc. 3825
363	Surgical & Medical Instruments	620400	3841
364	Surgical Appliances & Supplies	620500	3842
365	Dental Equipment & Supplies	620600	3843
366	Watches & Clocks	620700	3873
367	Optical Instruments & Lenses	630100	3832
368	Ophthalmic Goods	630200	3851
369	Photographic Equipment and Supplies	630300	3861

### MISCELLANEOUS MANUFACTURING

370	Jewelry, Precious Metal	640101	3911
371	Jewelers' Materials	640102	3915
372	Silverware & Plated Ware	640104	3914
373	Costume Jewelry	640105	3961
374	Musical Instruments and Parts	640200	3931
375	Toys and Sporting Goods	640300, 640400	3942, 3944, 3949
376	Office and Artists' Materials	640500	395
377	Miscellaneous Notions	640600, 640700	396

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
378	Brooms, Brushes, & Hard Surface Floor Coverings	640800, 640900	3991, 3996
379	Miscellaneous Manufactured, Durable Goods	640800, 640900 641000, 641100, 641200	3993, 3995, 3999

## TRANSPORTATION AND COMMUNICATION

380	Railroads & Rail-Related Services	650100	40, 474, Pt. 4789
381	Passenger Transportation, N.E.C.	650200	41
382	Motor Freight	650300	42, Pt. 4789
383	Water Transportation & Related Services	650400	44
384	Air Carriers & Related Services	650500	45
385	Pipelines, Except Natural Gas	650600	46
386	Transportation Services, N.E.C.	650700	Pt. 47
387	Communications, Except Radio and Television	660000	48, Except 483
388	Radio and Television Broadcasting	670000	483

## UTILITIES

389	Electric Utilities	680100	491, Pt. 493
390	Gas Utilities	680200	492, Pt. 493
391	Water & Sewer Services	680300	494-497, Pt. 493

## TRADE

392	Wholesale Trade	690100	50, 51
393	Retail Trade	690200	52-57, 59, 7396, 8042

## FINANCE, INSURANCE, AND REAL ESTATE

394	Banking	700100	60
395	Credit Agencies & Security Brokers	700200, 700300	61, 62, 67
396	Insurance Carriers & Agents	700400, 700500	63, 64
397	Owner-Occupied Dwellings	710100	NA
398	Real Estate	710200	65, 66, Pt. 1531

# ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
<b>SERVICES, N.E.C.</b>			
399	Hotels & Lodging Places	720100	Pt. 70
400	Miscellaneous Personal Services, N E C.	720200	Pt. 72, 762-764, Pt. 76
401	Beauty & Barber Shops	720300	723-724
402	Personnel Supply Services	730103	736
403	Computer & Data Processing	730104	737
404	Management & Consulting, Laboratories	730105	7391, 7392, 7397
405	Equip. Rental & Leasing	730107	7394
406	Other Business Services:		
	Misc. Repair Shops	730101	769
	Services to Dwellings	730102	734
	Detective Services	730106	7393
	Photo Labs, Copying, Photography	730108	7332-3, 7395
	Other Business Svcs	730109	732, 7331, 7339, 735, 7399
407	Newspaper	730200	731
408	Magazine	730200	731
409	TV (Network, Spot & Local)	730200	731
410	Radio	730200	731
411	Other	730200	731
412	Legal Services	730301	811
413	Engineering, Architecture, Surveying	730302	8911
414	Accting, Auditing, & Misc. Proj.	730303	893, 899
415	Eating & Drinking Places	740000	58, Pt. 70
416	Auto Rental & Leasing (w/out drivers)	750001	751
417	Auto Repair, Parking & Wash	750002-3	753, 7549, 752, 7542
418	Motion Pictures	760100	78
419	Amusement & Recreation Services	760200	79
420	Doctors & Dentists	770100	801-803, 8041
421	Hospitals	770200	806
422	Nursing & Personal Care	770301	805

### ORDERING CODES FOR PRODUCT DEMAND REPORTS

Order Number	Title	I/O Product Code	SIC Industry Code
423	Other Medical Services	770302	074, 8049, 807-809
424	Educational Services	770401-3	82
425	Nonprofit Organizations	770501-4	84, 86, 8922
426	Social Services, N.E.C.	770600-770900	83

#### GOVERNMENT AND OTHER

427	U.S. Postal Service	780100	4311
428	Other Federal Government Enterprises	780400	NA
429	State & Local Government Enterprises	790300	Pt. 41

**ORDER FORM FOR DEIMS REPORTS**

\_\_\_\_\_  
**Name**

\_\_\_\_\_  
**Title**

\_\_\_\_\_  
**Company**

\_\_\_\_\_  
**Address**

\_\_\_\_\_  
**City**

\_\_\_\_\_  
**State**

\_\_\_\_\_  
**Zip**

**Product Report Numbers Desired:**

\_\_\_\_\_

**Please send me more information on:**

\_\_\_\_\_ **Defense demand for skilled labor;**

\_\_\_\_\_ **Defense demand for strategic materials;**

\_\_\_\_\_ **Regional defense impacts.**

**Mail to:**

**Office of the Under Secretary of Defense  
for Research and Engineering  
Office of Industrial Base Assessment  
5203 Leesburg Pike, Suite 1406  
Falls Church, VA 22041**



**FEEDBACK FORM**

1. Did this booklet provide the material you needed to interpret the projections in which you were interested? If not, what were the most important missing items?

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2. Did the projections for your industry seem to be reasonable?

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3. Are there other published forecasts to which the DEIMS projections for your industry can be compared?

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4. What parts of the DEIMS projections for your industry were most and least useful to you?

**MOST**

- \_\_\_\_\_ Breakdown of indirect defense purchases by industrial sector
- \_\_\_\_\_ Breakdown of defense purchases by budget category
- \_\_\_\_\_ Projections of nondefense purchases
- \_\_\_\_\_ Projections of components of nondefense purchases
- \_\_\_\_\_ Other: \_\_\_\_\_
- \_\_\_\_\_

**LEAST**

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5. Comments on the format of the DEIMS report:

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OPTIONAL

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Name

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Title

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Company

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Address

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City

State

Zip

Return to:  
Economic Analysis Division  
Office of the Director, Program  
Analysis and Evaluation  
Office of the Secretary of Defense  
The Pentagon, Room 2B284  
Washington, D.C. 20301

END

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